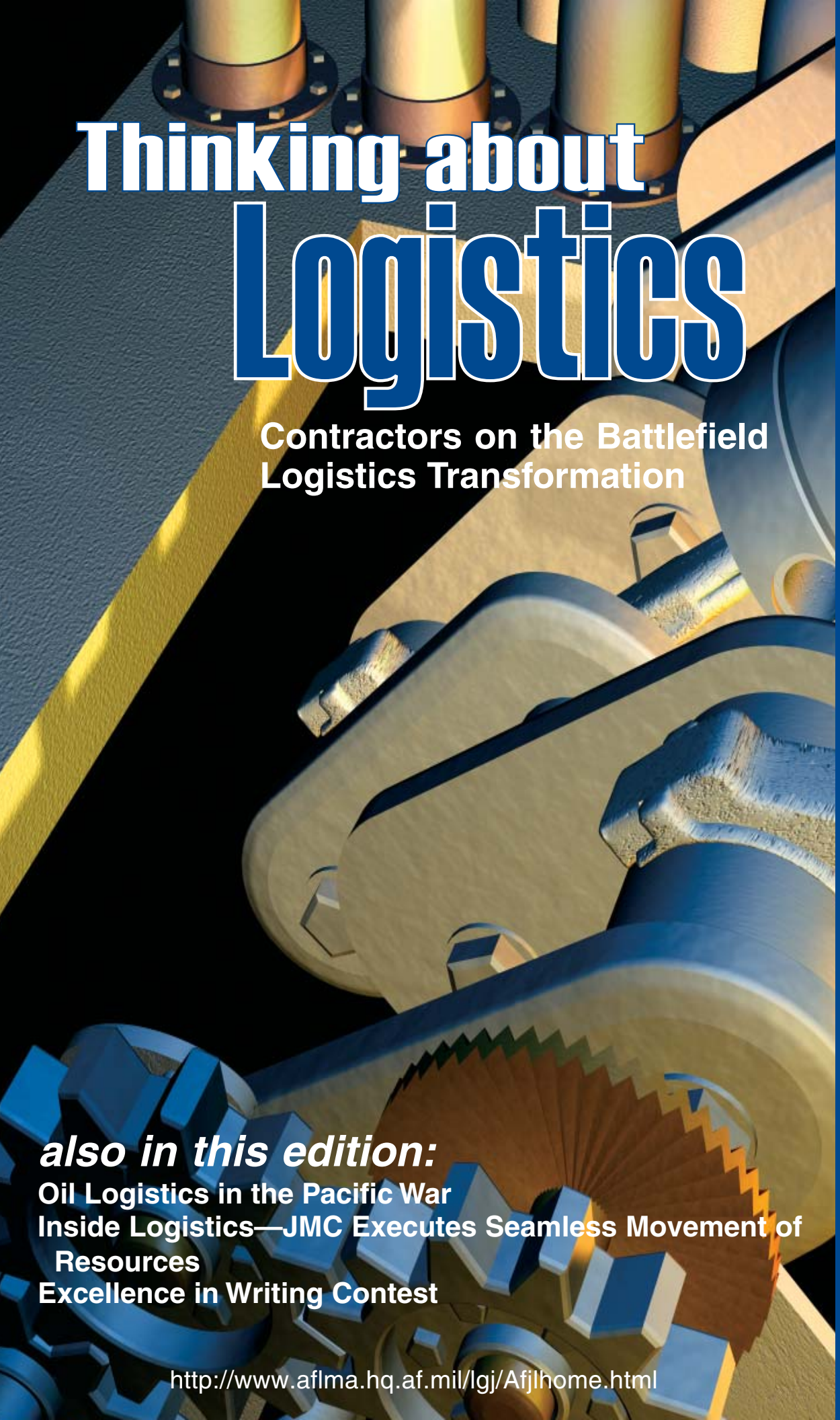

Thinking about Logistics

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The Japanese were not the first to ignore the importance and vulnerability of logistics. As long ago as 1187, history shows that logistics played a key part in the Muslim's victory over the Crusaders at the Battle of Hittin. The Muslim commander Saladin captured the only water source on the battlefield and denied its use to the Crusaders.

Oil Logistics In the Pacific War

Oil's Role in Japan's Decision for War

The shortage of oil was the key to Japan's military situation. It was the main problem for those preparing for war, at the same time, the reason why the nation was moving toward war.... Without oil, Japan's pretensions to empire were empty shadows.

—Louis Morton
Command Decisions[1]

Oil Available in the Netherlands East Indies

June 1941 was a pivotal month for the future of Japanese oil supplies. The Japanese had been in economic negotiations with the Netherlands East Indies (NEI) government in Batavia since September 1940 and were seeking a special economic position in the Netherlands East Indies. Previous embargoes of aviation fuel, iron, and scrap steel by the United States in July and October 1940 (to counter the

Japanese occupation of northern French Indochina) had sent the Japanese searching for alternative sources of raw materials. Also, the entrance of Japan into the Tripartite Pact with Germany and Italy on 27 September 1940, a pact that was aimed directly against the United States, further exacerbated US-Japanese relations. The Netherlands East Indies seemed to fit this bill, the Nazis (a putative partner of the Japanese) had overrun the NEI's parent country, and its geographic location put the Japanese closer to the Netherlands East Indies than any of the latter's allies. Thus, the Netherlands East Indies was deemed to be more malleable to Japanese desires than the increasingly recalcitrant United States. Some of Japan's demands included participation in NEI natural resource development and freedom of access and enterprise in the Netherlands East Indies, as well as a steady supply of oil. However, Japanese aspirations were about to receive a serious setback.[2]

The NEI government was willing to negotiate with the Japanese, but Batavia was not willing to yield special economic concessions to the Japanese (there were to be increases of nonpetroleum products). Although these increases were less than what was sought, they did fulfill Japanese needs. Japanese requests for larger exports of oil were passed on to the NEI oil companies, but these requests were deferred. Also, Japanese requests to conduct military and political activities in the Netherlands East Indies were also rejected. On 17 June 1941, economic talks were broken off between Japan and the Netherlands East Indies.[3]

Almost directly on the heels of the breakdown in talks between Batavia and Tokyo was an announcement from the United States on 20 June 1941 that, henceforth, no petroleum would be shipped from the US east coast, or gulf coast ports, outside the Western Hemisphere. There was a shortage of fuel for domestic use on the east coast of the United States in June 1941. To ship fuel out of areas with shortages to semibelligerent foreign governments was politically untenable for the US Government. Thus, from Japan's point of view, the commodity most desired by them was being choked off.[4]

Because of this reversal of fortunes, Japan felt it must make a move toward securing a source of oil in Southeast Asia:

> Consequently, at an Imperial conference on 2 July, Japan decided to adopt the "Outline of the Empire National Policy to Cope with the Changing Situation." By executing a daring plan calling for the occupation of southern French Indochina, Japan hoped to gain dominance over the military situation in the southern areas and to force the Netherlands East Indies to accede to her demands.[5]

Japan Needs a Secure Source of Oil

The move into southern French Indochina was not without some internal debate in Japan. In the end, however, it was decided that the military occupation of the territory was too good an opportunity to pass up. By occupying the southern half of French Indochina, the Japanese would consolidate their strategic position; it would stop the encroachment of the ABCD powers on her economic life line. Also, the occupation would be a blow to the Chungking government and help settle the China issue; it would also put pressure on the NEI government to come to terms with Japanese demands.[6] The Japanese were not making this move as a step toward provoking the United States, Britain, or the Netherlands East Indies to war; Tokyo wished economic negotiations to continue. The move into southern Indochina was a preemptive action that would help the Japanese if conflict with the ABCD powers became inevitable.[7] One wonders if the Japanese later realized that their actions eventually turned into a self-fulfilling prophecy.

The Japanese did not consider how the ABCD powers would react to Tokyo's move into southern Indochina.[8] Indeed, Tokyo felt that this move was possible because it believed the threat of US economic sanctions to the Japanese move to be less than 50 percent. The Japanese still moved forward, even though President Franklin D. Roosevelt had hinted to Kichisaburo Nomura, the Japanese Ambassador to the United States, that sanctions would occur if Tokyo moved troops into southern Indochina.[9] However, the Japanese felt that the United States would not follow through with such a move because it would provoke a war at a time when the United States was not ready to fight.[10]

There was some logic in the Japanese thought process. Since March 1941, the United States and Japan had been in dialogue to avoid such a war. However, as much as the United States wanted to avoid war, it would not do so at the sacrifice of basic principles of international conduct.[11] Therefore, reaction from the United States was swift. With the Japanese movement into southern French Indochina, the United States froze all Japanese assets on 25 July 1941.[12] The governments of Great Britain and the Netherlands East Indies soon followed with their own freezing actions.[13]

With this freezing action came a complete embargo of all oil products into Japan by these countries. It was not the intent of Roosevelt to bring about a complete embargo of oil to Japan.[14] He felt that such an action would cause the Japanese to invade the Netherlands East Indies and Malaya to seize the oilfields there. This would possibly suck the United States into an early conflict in the Pacific, a conflict the United States was not prepared for and which would be at the expense of devoting energy toward the European conflict.[15] Roosevelt's freeze order allowed the Japanese to apply for export licenses for oil; however, hard liners within Roosevelt's administration acted as if the freeze were total, so no licenses were ever approved.[16]

This situation put the Japanese into a quandary; they did not gain any oil by moving into southern Indochina. Now they had isolated themselves from 90 percent of their annual requirements. The Japanese did have a strategic reserve in place that they had been building up since the early 1930s. So some time was available to try and find a diplomatic way out of the impasse.[17]

Oil in the Netherlands East Indies Cannot Be Secured without US Intervention

Throughout the summer and into the fall of 1941, Japanese negotiators and the United States were at loggerheads. The US-led embargo would not be suspended until the Japanese stopped their militaristic expansion; indeed, Japan would have to roll back some of its gains. Included in the US demands were calls for a retreat from all French Indochina and China. This demand was unacceptable to the Japanese.[18] Likewise, the minimum demands of the Japanese stated that the United States must accept the current status quo in east Asia with vague promises that the Japanese would withdraw from disputed areas once peace had been established in the Far East on a fair and just basis.[19]

Meanwhile, Japanese oil stocks were dwindling. If the Japanese could not get oil by negotiation, they would have to use force. The nearest available source was in the Netherlands East Indies. Would it be possible to seize the oil there without involving the British and the Americans? There were numerous reasons why Tokyo felt this was not the case.

The Japanese had come into possession of British War Cabinet minutes that stated the British would fight alongside the Dutch if the Japanese invaded the Netherlands East Indies.[20] The Japanese were also aware that any conflict involving them and the British would draw the United States into conflict on the side of the British.[21] The director of the War Plans Division of the Navy Department, Admiral Richmond Kelly Turner, confided this policy to Nomura "that the United States would not tolerate, in view of its policy of aiding Britain and its interpretation of self-defense, a Japanese threat to the Malay barrier."[22] The United States was not limiting its interest to the British. In a note handed to Nomura from Roosevelt, the United States stated any further aggression by Japan against its neighbors and the United States would be forced "to take immediately any and all steps which it may deem necessary" to safeguard US interests.[23] Finally, the Japanese foreign office believed some type of military understanding had been reached among Washington, London, and Batavia. The Foreign Office produced two reports that supported its claims that a joint ABCD defense understanding existed and was being implemented.[24]

Even with this potential alliance arrayed against them, could the Japanese afford to dismiss the warnings as bluster? As appealing as the thought was, the B-17s based at Clark Field and the Cavite Naval Base in Manila Bay were too much of a strategic threat to the Japanese lines of communication. Any shipments of raw materials that the Japanese might acquire in the Netherlands East Indies or Malay Barrier potentially could be attacked by US forces stationed in the Philippines. Because of this, those US forces would have to be dealt with if the Japanese could not get the resources they needed diplomatically.[25]

All these factors played into the Japanese belief they eventually and inevitably would come into conflict with the United States. As far back as 1909, the United States was identified as one of the principal enemies of Japan.[26] Indeed, the Japanese realized fairly soon after the oil embargo was imposed that the Japanese and American positions were mutually exclusive. At the 6 September 1941 Japanese Imperial Conference, materials addressing such a question were distributed to the participants.

> *Is War with the United States Inevitable?*…it appears that the policy of the United States toward Japan is based upon the idea of preserving the status quo and aims, in order to dominate the world and defend democracy, to prevent our empire from rising and developing in Eastern Asia. Under these circumstances, it must be pointed out the policies of Japan and the United States are mutually inconsistent and that it is historically inevitable the conflict between the two countries, which is sometimes tense and moderate, should ultimately lead to war.
>
> If we should ever concede one point to the United States by giving up a part of our national policy for the sake of a temporary peace, the United States, its military position strengthened, is sure to demand tens and hundreds of concessions on our part, and ultimately, our Empire will have to lie prostrate at the feet of the United States.[27]

It should be noted that these were not the views of one individual alone but those of the government and the supreme command of the Japanese military. If Japan were to obtain the oil and other resources it needed, it would have to control the Netherlands East Indies and the Malay Barrier. Japan also would have to remove the US threat to this plan.

Pearl Harbor and the Southern Operation

Japanese naval strategy was built around the premise that when the United States and Japan went to war it would be a one-time decisive battle. The Japanese believed a large American fleet, as much as 40 percent larger than the Japanese fleet because of restrictions imposed by the Washington Naval Treaty, would drive across the Pacific to attack the Japanese. During this drive, the Japanese would initially send out submarines to whittle down the size of the US fleet. Closer in, the Japanese would throw land- and carrier-based aircraft into the battle. Once the reduced US fleet was far enough into the western Pacific, the Imperial Japanese Navy (IJN) would sortie out and engage in a classic ship of the line battle that the Japanese would inevitably win.[28]

The problem with this strategy was that it was passive. Japan would have to devote the majority of its fleet to support amphibious landings if the Southern Operation of seizing the Netherlands East Indies and Malay Barrier were to succeed. The decisive battle plan left the initiative and time of the conflict up to the US Navy. This left Japanese forces even more at risk after the US Pacific Fleet's move to Pearl Harbor. If that fleet could be neutralized or destroyed at Pearl Harbor, it would deprive the US fleet of any initiative and allow the Japanese to run unhindered in the southern area.[29] This line of thought ran totally counter to 30 years of navy doctrine, and ordinarily, it would have been dismissed.[30] However, this proposal came from the current head of the Combined Fleet, Admiral Isoroku Yamamoto, and could not be easily brushed aside.

Origins of the Pearl Harbor Attack

Yamamoto was opposed to conflict with America. He felt that, given the material and technological strength of the United States, Japan would have no hope of ultimate victory over America. If it came to blows though, Yamamoto would put forth every effort to ensure the goals of his homeland were achieved.[31] He had doubts whether the Japanese Navy could seize the vast southern areas with the majority of its forces and fend off a flank attack by the US Navy at the same time. The solution that Yamamoto came up with was to take out the Pacific Fleet with one quick action. Then the Southern Operation could proceed unmolested and new Japanese gains consolidated. Yamamoto placed heavy emphasis on aerial warfare because of an earlier posting with the air arm of the Japanese Navy. With the advances the Japanese Navy made in aerial warfare, Yamamoto began contemplating an aerial strike on the fleet at Pearl Harbor. This plan, or the Hawaii Operation as it came to be known, became the means to achieve that goal.[32]

Yamamoto built a planning staff to address the possible Hawaii Operation. One of the first officers tasked was Commander Minoru Genda, the man who brought forth a feasible plan for the strike. Among other things, Genda stressed the need for a surprise attack by a six-carrier task force, which would refuel at sea to make the long voyage. His plan would concentrate the

IJN's aerial attack on US Navy carriers and Pearl Harbor's land-based aircraft. These targets were to be the primary ones; other strategic targets—such as the oil storage facilities, drydocks, and so on—were not mentioned at all.[33]

There was disagreement as to the feasibility of the Hawaii Operation from not only the Naval General Staff but also officers within the First Air Fleet staff that would be tasked to carry out the Pearl Harbor attack plan.[34] The plan was finally put before the Japanese Naval General Staff in wargames from 10 to 13 September 1941 at the Tokyo Naval War College. The exercise demonstrated the practicality of the Pearl Harbor attack, but it was felt by the general staff that the chance of the strike force's being detected was too high, thus putting almost all Japan's aircraft carriers at risk.[35] Yamamoto's staff was not deterred. They stressed Yamamoto's argument:

> The present situation—*i.e.*, that of the US fleet in the Hawaiian Islands, strategically speaking—is tantamount to a dagger being pointed at our throat. Should war be declared under these circumstances, the length and breadth of our Southern Operation would immediately be exposed to a serious threat on its flank. In short, the Hawaii Operation is absolutely indispensable for successful accomplishment for the Southern Operation.[36]

Yamamoto's personal feelings were best summed up in a letter to a friend:

> I feel, as officer in command of the fleet, that there will be little prospect of success if we employ the normal type of operations…. In short, my plan is one conceived in desperation…from lack of confidence in a perfectly safe, properly ordered frontal attack; if there is some other suitable person to take over, I am ready to withdraw, gladly and without hesitation.[37]

It was the same argument he used with the Naval General Staff, in a sense "my way or the highway." No one was willing to let the commander in chief resign, so after about a month of deliberations, the plan to attack Pearl Harbor was approved.[38]

Securing the Eastern Flank

Along with the Hawaii Operation, ancillary plans were drawn up to seize the US bases at Wake, Guam, and the Philippines.[39] Occupation of these territories would complement Japanese island holdings in the Central Pacific that were acquired after World War I. These seizures would help build an impregnable barrier against the Americans when such time arose that the US Navy would finally be able to sortie a fleet against the Japanese.

It was a strategy built on sound principles. Because of the Washington Naval Treaty's limitations, the United States was forbidden to build up any bases west of Pearl Harbor. After the Japanese withdrew from the Washington Accords,[40] proposals were made by a Navy board, in late 1938, to beef up its defenses west of Hawaii. However, the appropriations never made it through Congress.[41] Thus, if the Japanese attacked, these bases would fall relatively quickly. This would leave no US bases in the entire Pacific west of Hawaii.[42] Any operations planned by the Navy would have to be run out of and supported from Pearl Harbor.

Time Is Oil

The Japanese felt they had a finite amount of time in which to solve their oil problem. It was decided at the 5 November 1941 Imperial Conference that Japan would go to war with the United States (and Great Britain) if negotiations to break the diplomatic impasse were not successful by 1 December 1941. Guidance from this same meeting directed the Army and Navy to complete plans for the Hawaii and Southern Operations.[43]

There were many reasons this stance was adopted at the conference. First, every day the Japanese delayed the Southern Operation, ABCD forces were growing larger. For example, Army strength in Malaya and the Philippines was being reinforced at the rate of 4,000 men every month; air strength and infrastructure were also increasing. It was also feared that the ABCD powers would become closer politically, economically, and militarily in the interim.[44] There was concern that the Soviet Union possibly would attack Japan in the springtime. If this occurred, the Japanese wanted to be sure the Southern Operation had been completed.[45] Another concern was the weather. The northeast monsoon would make the amphibious landings required in the Southern Operation increasingly difficult after December.[46] It also would affect ships in the Hawaii Operation. Refueling at sea was an absolute necessity for the First Air Fleet to have the range to strike Pearl Harbor. Meteorological studies showed there were only 7 days, on average, that refueling could be accomplished in December.[47] That number could be expected to decrease with the onset of the winter season.

However, the ultimate factor that decided the start of offensive operations was the status of the Japanese fuel stockpile. The Japanese realized that oil was the bottleneck in their fighting strength; any lengthy delay in securing an oil source would be disastrous.[48] Indeed, it was stated at a conference in late October 1941 that Japan needed to occupy the oilfields in the southern areas by March. If this did not occur, adding in such factors as normal stockpile depletion and getting the oilfields back into production, the Japanese would run out of oil in about 18 months.[49] By September 1941, Japanese reserves had dropped to 50 million barrels, and their navy alone was burning 2,900 barrels of oil every hour. The Japanese had reached a crossroads. If they did nothing, they would be out of oil and options in less than 2 years. If they chose war, there was a good chance they could lose a protracted conflict. Given the possibility of success with the second option, versus none with the first option, the Japanese chose war.[50]

There are many critical points of this preconflict period. The Japanese realized the importance of oil to their modern military machine, and any operations undertaken in the vast Pacific theater would require large amounts of oil. They were willing to send a huge task force of irreplaceable ships thousands of miles into hostile waters (and all the attendant oil this operation would consume) to attack a formidable enemy fleet to help achieve oil self-sufficiency.[51] The concurrent plan to seize the US possessions in the Central Pacific would ensure the Japanese would control all the oil-producing regions between the west coast of the United States and the Persian Gulf. Finally, there is the planning of the Pearl Harbor raid; without oil tankers, it would have been impossible for the Japanese Navy to accomplish that mission. Armed with this knowledge, would the Japanese realize this same need for oil applied to the US Navy?

Oil, Pearl Harbor, and the US Navy

The thing that tied the fleet to the base [Pearl Harbor] more than any one factor was the question of fuel.

—Admiral Husband E. Kimmel
Joint Committee on the Investigation of the Pearl Harbor Attack[52]

Like the Japanese, the Pacific Fleet had its own oil problems. The only major base for the US Navy in the Pacific was located in Hawaii. All major fleet logistics, repair, and storage were at the naval base at Pearl Harbor. The Navy also suffered from a severe shortage of oilers, which limited the operations radius of the fleet. The Japanese were well-informed on the strengths and logistics necessities of the Pacific Fleet. With the known vulnerabilities of the Pacific Fleet's logistics train, the Japanese, nevertheless, chose to attack military combatants only, such as the US battleships. This operational strategy was going to come back and haunt the Japanese.

Japanese Intelligence on the US Navy and Pearl Harbor

Extensive intelligence gathering by the Japanese informed them of the abilities, limitations, and makeup of the Pacific Fleet and those areas and facilities required for its support. No scrap of information was too small. Detailed intelligence on the Pacific Fleet was the linchpin of the Hawaii Operation.[53]

> The information received from the Japanese after the war shows that their methodical observations and espionage kept them well informed of everything concerning the defenses of Hawaii and the activities of the Pacific Fleet. In our open democratic society, Japanese agents were free to observe fleet practices, take photographs with their high-powered equipment, and solicit almost any information desired…. High-powered binoculars were hardly necessary, but they showed particular details, which, in large measure, were unknown even to any single officer of the fleet.[54]

The IJN intelligence officer at Pearl Harbor was Ensign Takeo Yoshikawa. From the spring of 1941, he was in charge of intelligence gathering in Hawaii. Yoshikawa had been studying methods and operations of the Pacific Fleet for the previous 7 years.

> I read a vast amount of material in that period, from obscure American newspapers to military and scientific journals devoted to my area of interest .... I studied *Jane's Fighting Ships* and *Aircraft*…devoured the *US Naval Institute Proceedings* and other US books…and magazines…. In addition to this mass of seemingly innocuous information on the Navy and its bases, I had access to the periodic reports of Japanese agents in foreign ports, particularly Singapore and Manila….
>
> In any event, by 1940, I was the Naval General Staff's acknowledged American expert—I knew by then every US man-of-war and aircraft type by name, hull number, configuration, and technical characteristics; and I knew, too, a great deal of general information about the US naval bases at Manila, Guam, and Pearl Harbor.[55]

It should be noted that the ship information being collected on the west coast also included commercial traffic, especially petroleum shipments. Radio intercepts of Japanese diplomatic messages showed that in mid-1941, Japanese agents operating out of Los Angeles reported the departure of five tankers carrying 400,000 barrels of high-octane fuel to Vladivostok.[56]

The result was a vast intelligence tome, *The Habits, Strengths, and Defenses of the American Fleet in the Hawaiian Area*. In addition, detailed maps of Pearl Harbor were drawn up showing all the information reported above, to include the locations of fuel-storage depots.[57] Yamamoto and the Japanese Navy had the required information to target the Pacific Fleet at Pearl Harbor. Since the purpose of the Hawaiian Operation was to eliminate the Pacific Fleet as a threat, the question was whether Yamamoto would use this information to hit the most vulnerable center of gravity to achieve that goal.

The Primary Targets of the Pearl Harbor Attack Were Ships

On the morning of 7 December 1941, there were 86 ships of the Pacific Fleet in Pearl Harbor. At the end of that day, nine of the ships were sunk or sinking, and ten others were severely damaged in the raid. [58]

The most important targets among the ships of the Pacific Fleet were the aircraft carriers. Intelligence indicated there would be no carriers in Pearl Harbor that morning, however, so Battleship Row on the east side of Ford Island would be the initial focal point of the raid.[59] The 352-plane raid[60] lasted from 0755, when the first bomb exploded near the seaplane ramp on Ford Island, to approximately 1000 Hawaiian time when the last Japanese planes headed north to their carriers.[61] By the time the raid ended, the Japanese had caused significant injury to the Pacific Fleet; eight battleships, three light cruisers, three destroyers, and four auxiliary vessels were sunk or damaged. There were also major losses among Army and Navy air forces on the island of Oahu and nearly 3,600 US casualties. The Japanese, on the other hand, lost 29 aircraft and 5 midget submarines.[62] Surprise, the key tenet to the success of the Hawaii Operation, had been utter and complete.[63]

Horrible and devastating as the Pearl Harbor raid was, it was by no means a knockout blow to the Pacific Fleet. It is true that all eight battleships attacked on 7 December were either sunk or damaged. However, many factors mitigated the overall results of the attack. It is probably most important to note that the majority of sailors, less those who were killed outright in the attack or in the capsized *Oklahoma*, were easily rescued because the attack took place in a relatively small, landlocked harbor. Another factor was the physical state of the ships located on Battleship Row that morning. Professor Thomas C. Hone best stated this condition: "The American battleships were all old; several were nearly overage; most were overweight. None of the battleships in Pearl Harbor was a first-line warship in a material sense; all had recognized deficiencies."[64] They were also a good 10 knots slower than the US aircraft carriers.[65] These details were not unknown to the hierarchy of the Pacific Fleet. When Vice Admiral William F. Halsey was asked whether or not he wanted to take any battleships with him on his reenforcement trip to Wake Island, he retorted "Hell, no! If I have to run, I don't want anything to interfere with my running!"[66] Last, but not least, because of the shallowness of Pearl Harbor, which had an average depth of only 40 feet, all but two battleships eventually would be salvaged.[67] The Japanese were well-aware of the depth of the harbor and the fact some ships would be salvaged. However, the Japanese felt American salvage efforts would take a lot longer than the time required to complete IJN operations in the Southern Area.[68]

Figure 1. Aerial View of Pearl Harbor Drydock, 10 December 1941. Note the improvised antitorpedo barriers located near the drydock openings. *USS Pennsylvania* and the sunken destroyers *Cassin* and *Downes* are in the lower, No 1, drydock. The *USS Helena* occupies the middle drydock. The *USS Shaw* and the sunken drydock *YFD-2* are on top. Numerous support shops and base facilities are located in the lower right corner. Also, note the black oil streaks on the harbor surface. [77]

Figure 2. Submarine Base, Pearl Harbor and Adjacent Fuel Tank Farms, 13 October 1941. This is a view of the upper oil tank farm located on the east side of the Pearl Harbor naval base. The lower tank farm was located between Hickam Field and the naval base (see Figure 1 for oil tanks in the lower farm). Note the attempts at camouflage. Two of the tanks in the foreground are painted to resemble terrain features. The third, closest to the submarine base, is painted to resemble a building.[87]

Commander Mitsuo Fuchida, airborne leader of the Pearl Harbor attack force, verbally reported strike results to Vice Admiral Chuichi Nagumo after landing on the carrier *Akagi* following the raid:

> Four battleships definitely sunk . . . . One sank instantly, another capsized, the other two may have settled to the bottom of the bay and may have capsized. This seemed to please Admiral Nagumo who observed, "We may then conclude that anticipated results have been achieved."
>
> Discussion next centered upon the extent of damage inflicted at airfields and airbases, and I expressed my views saying, "All things considered, we have achieved a great amount of destruction, but it would be unwise to assume that we have destroyed everything. There are still many targets remaining which should be hit."[69]

As far as Nagumo was concerned, though, his primary mission had been accomplished. Now his concern turned to the missing US carriers and their threat to his task force. There was no provision in the Pearl Harbor attack plan to remain in the Hawaiian area to search for US ships not at anchor at the time of attack. Nagumo, who had opposed the Hawaii Operation at its inception, was ready to withdraw. His chief of staff, Rear Admiral Jin'ichi Kusaka, had held the same opinion. Kusaka recommended to Nagumo that the fleet withdraw to Japan. Nagumo immediately concurred. A second strike on Pearl Harbor—which would have focused on the dockyards, fuel tanks, and remaining ships—was canceled.[70]

Drydocks, Repair Shops, and Oil Storage Areas Spared

Nagumo did not realize the magnitude of his error in not completing the destruction of Pearl Harbor by attacking the base and fuel facilities. His pedantic and traditional view of naval strategy blinded him to the opportunity of a lifetime.[71] Never again would the Japanese Navy be in a position to deliver such a mortal blow to the US Fleet.[72]

Ironically, the Japanese missed their opportunity to strike at the drydocks during the initial attack. Torpedo bombers approaching from the west over Ford Island commenced their run on the battleship *Pennsylvania*. Once they came over the island, the Japanese pilots saw that it was moored in drydock No 1. Seeing this, the torpedo bombers shifted their attack runs toward a cruiser, the *USS Helena*, and the destroyer *Ogala* (actually a minesweeper).[73] They would have been served better by attacking the drydocks. Torpedo strikes on the drydock gates would have rendered these essential repair facilities inoperable until those gates were repaired or replaced. It certainly was a fear of the Navy that the Japanese would return and do just that (Figure 1). As can be seen in Figure 1, salvage operations were up and running almost immediately. The drydocks, along with the base support and repair facilities, were never targeted specifically. The only bombs that fell near these critical facilities were intended for ships on or near these facilities.[74] Had Nagumo returned with a third wave, he could have leveled the navy yard's support facilities,[75] thereby destroying the Navy's industrial capacity and setting back salvage operations.[76] This oversight would come back to haunt Nagumo in a most personal fashion.

The *USS Yorktown* utilized drydock No 1 after the mauling it had received on the Coral Sea. In a turnaround that can be described nothing short of miraculous, essential temporary repairs were made, and it was sent back out to sea within 72 hours for the critical Midway battle. There, its aircraft were crucial in sending all four of Nagumo's carriers to the bottom of the sea.[78]

By far, the most surprising target oversight of the Japanese attack was the oil and gas storage tanks. The entire fuel supply for the Pacific Fleet was stored in above-ground tanks on the eastern side of the naval base (Figure 2).

As can be seen in Figure 2, these tanks were perfectly visible to the naked eye; ergo, perfect targets.[79] These tanks were particularly susceptible to enemy action; none of the tanks had bombproof covers.[80] Even a few bombs dropped amongst the tanks could have started a raging conflagration.[81]

Why were these crucial targets not hit? Their loss essentially would have starved the Navy out of the Central Pacific.[82] Did the Japanese not know they were there?

> The Japanese knew all about those oil storage tanks. Their failure to bomb the Fleet's oil supply reflected their preoccupation with tactical rather than logistical targets . . . . Nagumo's mission was to destroy Kimmel's ships and the airpower on Oahu. If Yamamoto and his advisers chose the wrong targets, or insufficiently diversified ones, the mistake rests on their shoulders . . . .[83]

Pearl Harbor Was the Only Filling Station in Town

Pearl Harbor was the only refueling, replacement, and repair point for ships operating in the Hawaiian area.[84] Part of Pearl Harbor's duty of being the Pacific Fleet's chandlery was the stocking and disbursing of oil. To that end, the Navy had just finished restocking its tanks in Pearl Harbor to their total capacity of 4.5 million barrels of oil.[85] The loss of this amount of oil would have effectively driven the Pacific Fleet back to the west coast and effectively knocked almost all ships of the Pacific Fleet out of contention, instead of just 19.[86] The Japanese knew the importance of oil to a fighting fleet; after all, they had just started a war to achieve a secure source of oil. Why did they not see that the US Fleet needed a secure source of oil if it was to operate in the vast reaches of the Pacific?

Genda later wrote that the question of demolishing the oil tanks only arose after the attack's amazing success. "That was an instance of being given an inch and asking for a mile."[87] He insisted that the objective of the plan was to destroy American warships so they could not interfere with the Southern Operation; oil tanks did not enter into the original idea.

As no one could charge Genda with lacking either imagination or vision, this uncharacteristic obtuseness could be due only to failure to understand the importance of logistics. Most Japanese naval planners apparently suffered from this same myopia toward the less glamorous necessities of modern warfare.

> The Hawaiian Islands produced no oil; every drop had to be tanked from the mainland. Destruction of the Pacific Fleet's fuel reserves, plus the tanks in which it was stored, would have immobilized every ship based at Pearl Harbor, not just those struck on December 7 . . . . "We had 4½ million barrels of oil out there, and all of it was vulnerable to .50 caliber bullets."[88]

The state of Allied oil supplies in the rest of the Pacific theater was extremely poor. The Japanese rapidly captured the bases at Wake and Guam in pursuit of their Southern Operation goals. This geographically isolated the Philippines and made the US naval base there untenable.[89] A sampling of four other ports in the Pacific highlights this problem. Brisbane had 12,000 tons of fuel available in January 1941, Sydney and Melbourne both had 8,000, and Port Moresby had none. Other bases, in the Netherlands East Indies, for example, could not be counted on for oil supplies because of their proximity to Japanese airpower and imminent Japanese invasion.

Once the Japanese seized the oilfields in the Netherlands East Indies and Burma, they eliminated all potential oil supplies in the Pacific between the Americas and the Middle East.[90]

For the Allies, geography had become almost as big an enemy as the Japanese.[91] The fuel supplies at Pearl Harbor were crucial for the Navy to bring the war to the Japanese Navy. Admiral Chester W. Nimitz summed up the situation best, "Had the Japanese destroyed the oil, it would have prolonged the war another two years."[92]

A Lack of US Oil Tankers

It is interesting to note that only one ship located on Battleship Row on 7 December received no damage at all. Yet, had the Japanese sank or severely damaged this ship, its effect on the Pacific Fleet would have been almost as great a loss as sinking an aircraft carrier. That ship was the fleet oil tanker, *USS Neosho*.[93]

The lack of fleet oilers, like *Neosho*, hung like a large cement albatross around the neck of Navy planners contemplating operations in the Pacific before and after the Pearl Harbor raid.[94] This dearth of oilers was a key vulnerability of the Navy. The Japanese Navy, who had just seen how it would have been impossible to carry out the Pearl Harbor attack without tanker support, should have targeted these ships that were so crucial to the Navy.

In the years from 1925 to 1940, the quantity of most surface combatants in the Navy had doubled in size; the size of the auxiliary force had not. Although there had been an increase in the number of fleet oilers, they were all kept busy ferrying fuel between bases.[95] On 7 December, the Pacific Fleet had two oilers in Pearl Harbor and three at sea and six others in ports on the west coast; only four of these were capable of at-sea refueling.[96] This shortage of tankers effectively limited the radius of the Pacific Fleet.[97] It was also a key reason so many ships were located in Pearl Harbor on 7 December. Kimmel was unable to keep less than half his fleet at sea without starting to deplete the oil reserves at Pearl Harbor; his limited supply of oilers could not keep up with the deficit.[98]

Because of this lack of oilers, the fleet could not have even exercised its primary war plan (even if most of its battle line was not at the bottom of Pearl Harbor). The total capacity of the Pacific Fleet's oilers was 760,000 barrels of oil. In the first 9 days after Pearl Harbor, the fleet had expended 750,000 barrels of this sum. Thus, the fleet was tied to its oil supply at Pearl Harbor,[99] and if the Japanese had attacked the oil storage and the associated oilers at Pearl Harbor on 7 December, they would have driven the Pacific Fleet back to the west coast.[100]

If the Pacific Fleet had been forced back to the west coast, would it have been effective in opposing the Japanese? The short answer is no, especially if the Japanese began targeting oilers. To give an example, the *USS Lexington* was dispatched from California to assist in the search for Amelia Earhart in July 1937. First, the *Lexington* had to top off its bunkers on the west coast.[101] It then proceeded on a high-speed run of about 30 knots to the

Hawaiian Islands. Here, it had to refuel again from the fleet oiler *USS Ramapo* off Lahaina Roads, Maui. The result was that the *Lexington* did not arrive in the search area off Howland Island until 11 days after its departure from the west coast and could not even have done that without the support of the *Ramapo*.[102]

Ships *sortieing* from the west coast would be adding 2,000 nautical miles to their patrols into the Pacific just to get to Hawaii.[103] This number would have to be doubled, obviously, because these same ships would have to get back to the west coast if no oiler support were available and the oil storage at Pearl Harbor no longer existed.

The cruising ranges of the Pacific Fleet simply could not meet this necessity. The best range of the *Yorktown*-class carriers was 12,000 nautical miles at 15 knots, while older carriers had even less endurance.[104] Battleships had much less endurance and were slower. They averaged out at 8,000 nautical miles at 10 knots.[105] Cruisers were a little better off than the carriers; they averaged 14,000-14,500 nautical miles at approximately 15 knots. Destroyers, depending on their class, could go 6,000-9,000 plus nautical miles at 15 knots.[106] Looking at the carriers' and cruisers' endurance capabilities, the situation does not seem so bad. However, there are other factors that need to be thrown into the equation.

First, ranges needed to be decreased by a minimum of 15 percent whenever antisubmarine steering measures were taken.[107] Also, a prudent commander might want to avoid a suspected submarine-operating area altogether, if time and circumstances permitted such a detour. This too, would decrease overall endurance. Another factor was ship speeds. Higher speed means more fuel burned. Task force operations require much high-speed steaming for the launch and recovery of aircraft, search tasks, antisubmarine patrol, and so forth. This process, as can be seen by the previous *Lexington* example, burns a prodigious amount of fuel.[108]

The equation all boils down to the availability of oil and sufficient tankers to transport this precious commodity. Kimmel summed up this essential truth when he testified:

> A destroyer at full power exhausts its fuel supply in 30 to 40 hours, at medium speed in 4 to 6 days. War experience has proven the necessity of fueling destroyers every third day, and heavy ships about every fifth day to keep a fighting reserve on board. To have kept the entire fleet at sea for long periods would not have required 11 tankers but approximately 75, with at least one-third of them equipped for underway delivery.[109]

Oil Logistics After Pearl Harbor

The Japanese followed up their attack on Pearl Harbor with submarine operations off the west coast of the United States. These operations were planned to concentrate on striking warships versus logistical support ships and merchantmen. Although the Japanese managed to sink some ships, their submarine operations were a rather feeble effort compared to German U-boat operations against US commercial shipping in the Atlantic. The Germans committed wholesale slaughter along the east coast of the United States after Pearl Harbor. The number of available German submarines for these operations was even less than the Japanese deployment. Yet, the Germans' success was much higher because of their operational strategy of targeting Allied merchantmen, with an emphasis on oil tankers. The Japanese operational strategy of focusing only on symmetric targets, like warships, was adhered to even when asymmetric US vulnerabilities were present. This window of opportunity began to close slowly after Pearl Harbor. The Japanese lost all ability to exploit this weakness by late 1942; by then, they had lost the ability for the offensive, which was never to be recovered.

War Comes to the US West Coast

Japan's geographical situation determined that war in the Pacific would be, in large measure, a war to control the sea so as to exploit its new territorial gains in the Southern Operation. One of the items in its arsenal to help accomplish this task was the submarine.[110]

The overall strategic mission of the Japanese submarine force was to serve as an adjunct to the main battle force. This is to say, when an enemy fleet (the US Pacific Fleet) was bearing down on Japanese waters, the IJN submarines would sortie and intercept the Americans. The Japanese subs would maintain a reconnaissance of the enemy, reporting movements to the Japanese battle fleet, while reducing the enemy force by attrition. When the two fleets met, there would be a great Jutland-style clash that would determine everything.[111] The Hawaii Operation's whole tenet was to nullify the need for this strategy, at least for the first 6 months. However, the submarine was too valuable a tool to be withheld from operations, so the Japanese submarine force was included in the planning of the Hawaii Operation. It would be used for prestrike reconnaissance, to attack targets that escaped the airstrike, and to interdict a counterattacking force.[112] Thirty large fleet boats from the Sixth Fleet were to take part in the attack. Three were to operate as a screen for the Pearl Harbor strike force, 20 others were to position themselves around Oahu, and 5 others each were to carry a two-man midget submarine. The remaining two submarines were to conduct reconnaissance around the Aleutian Islands and other US possessions in the Pacific. Following the attack, 12 of the submarines would remain in the Hawaiian area, and 9 would proceed to the US west coast.[113] There, they were to interdict US lines of communication by destroying enemy shipping.[114]

Although it was part of the original Japanese grand strategy to vigorously prosecute attacks against US commercial shipping, this was not reflected in IJN submarine operations or tactical thought.[115] The Japanese submarines off the west coast of the United States were primarily there to strike at US naval assets.[116] The Japanese hamstrung themselves with their own rules of engagement when it came to merchant traffic. They only were allowed to use one torpedo per merchant ship. Because of this, they often surfaced to engage merchant vessels with their deck guns.[117] This action denied them the use of two of the best weapons the submarine possessed. First, they sacrificed the relative accuracy and lethality of their primary weapon, the torpedo.[118] Second, this tactic sacrificed one of the submarine's greatest commodities—stealth.

Nevertheless, the Japanese submarines did score some victories on the west coast of the United States. The *I-17* damaged one freighter with shell fire and caused the tanker *Emidio* to beach itself off Crescent City, California.[119] The submarine *I-23* attempted a surface attack on another tanker near Monterrey, California, but achieved no hits. The tanker *Agriworld* was able to get off a distress call to the Navy. Two surface attacks by the

submarine *I-21* yielded no results. However, its luck was about to change. It torpedoed and sank the tanker *Montebello* 20 miles from Avila, California, on the morning of 23 December. Two other torpedo attacks were made farther down the coast near Los Angeles by *I-19*; one was ineffectual, the other hit the freighter *Absaroka*. With the help of a nearby Navy tug, *Absaroka* was beached right below Fort MacArthur. An order for the subs to shell west coast cities was rescinded at the last minute, and the subs withdrew to Japanese waters in late December.[120] This order for a premature withdrawal (the subs had hardly made a dent in their torpedo stocks) possibly was due to overconfidence on the part of the Japanese. It was decided to recall subs in the eastern Pacific to support the Southern Operation.[121]

A few more attacks were made on west coast targets later in 1942. One strike that had merit was an attempt to start a large forest fire with bombs dropped by a sublaunched seaplane. Unfortunately for the Japanese, unseasonable rain and fog managed to keep the fire from spreading beyond a small area, and it burned itself out.[122] Another attack against a California oil refinery and tank farm was motivated more by personal rather than military strategy; in any case, that attack was also ineffectual.[123] From December 1941 to October 1942, Japanese submarines attacked just 19 merchant ships between Hawaii and the west coast; 15 of these were in December 1941.[124]

Overall, the Japanese submarine campaign on the west coast had meager results. Overconfidence, poor tactics, and a mentality that stressed commerce and logistical targets were not worthy of destruction let a golden opportunity slip through the Japanese's fingers.[125] Such would not be the case with their new partners one ocean over.

Roll of the Drums

For reasons probably known only to him, Hitler declared war on the United States on 11 December 1941.[126] For the scope of this article, why he declared war is not important; only the immediate results of that action are reviewed here. The German Navy no longer had any constraints on attacking American shipping. Since he was given such short notice of the imminent declaration of war, Admiral Karl Doenitz, head of Germany's submarine fleet, could only muster five submarines for this first foray into US waters. Operation *Paukenschlag* (Roll of the Drums) effectively began on 12 January 1942 with the sinking of the steamer *Cyclops* by *U-123*, 300 miles off Cape Cod.[127] The primary targets of *Paukenschlag* were to be Allied tankers. As Doenitz summed it up, "Can anyone tell me what good tanks and trucks and airplanes are if the enemy doesn't have the fuel for them?"

Doenitz' *Grey Wolves* fell on Allied shipping as if it was an unprotected flock of sheep. The Germans were aided by the fact the Americans were not at all prepared for what was about to occur. This lack of preparedness aided the Germans, and many mistakes were made. There was no blackout on the east coast, maritime navigational aids were still operating, and ships lacked communications security discipline.[128] From 13 to 23 January 1942, *Paukenschlag* subs sank 25 ships.[129] Seventy percent of the *Paukenschlag* losses were tankers, at an average of 130,000 barrels. If this attrition rate were kept up, the Allies would lose half their tanker fleet in 1 year.[130] The Germans came through *Paukenschlag* without any losses; in fact, not even one German submarine was ever attacked. The American antisubmarine warfare response was pitiful. There existed no plans to deal with the possibility of a submarine assault and no forces to implement them had they existed.[131] This is ironic because the Atlantic Fleet received 18 destroyers in a transfer from the Pacific Fleet in May 1941.[132]

German submarines eventually sank 391 ships in the western Atlantic, 141 of which were tankers. One quarter of the US tanker fleet was sunk in 1942. Even though US shipyards were beginning to produce new merchant ships in record numbers, there was still a drop in overall available merchant and tanker tonnage. This came at a time when every ship was needed to help support offensives around the globe in a two-ocean war.[133]

Unswerving Devotion to the Decisive Battle Strategy

"The massacre enjoyed by the U-boats along our Atlantic coast in 1942 was as much a national disaster as if saboteurs had destroyed half a dozen of our biggest war plants," wrote Samuel Elliott Morison. Petroleum shipped from the gulf coast to east coast ports dropped fourfold from January 1942 until it began to climb in mid-1943. Tanker tonnage was woefully short.[134]

The Germans, to their credit, realized the importance oil played in the Allies' war plan. As early as 3 January 1942, the Germans were urging the Japanese to concentrate their submarine efforts on a *guerre de course* strategy of commerce warfare. If the two Axis partners could concentrate their submarine efforts on Allied logistics, it would severely limit the Allies' ability to launch any type of offensive.[135] The German naval attache to Japan, Vice Admiral Paul H. Wenneker, repeatedly would urge such a change in strategy. The Japanese would listen courteously, but they were not willing to change their strategy of focusing on warships. Wenneker stated later:

> The Japanese argued that merchant shipping could be easily replaced with the great American production capacity but that naval vessels represented the real power against which they fought and that these vessels and their trained crews were most difficult to replace and hence were the logical targets. If, therefore, they were to hazard their subs, it must be against the Navy.[136]

The Japanese remained slavishly addicted to their decisive battle doctrine. Despite the success of German U-boats off the east coast of the United States (and even their success in World War I), the Japanese would not change their strategy of using subs to support fleet operations.[137]

Unfortunately for the Germans and the Japanese, the Axis alliance was a political arrangement based on self-opportunistic motives. Neither the German nor the Japanese Navy considered mutual cooperation in war planning a matter of much importance when Germany and Japan entered into their alliance with each other.[138]

The Japanese should have concentrated all their submarines off the US west coast oil ports and off Hawaii. While in these patrol areas, the subs should have systematically hunted down and destroyed US tankers and Navy oilers. The Japanese Navy also should have run a shuttle-type operation where some subs could be operating in these patrol areas at all times.[139] Had the Japanese followed such a strategy, there would have been much less chance that the Navy would have been able to launch any type of offensive in the Pacific in 1942.

Oil and South Pacific Ops

> During the first year of war in the Pacific, the United States Navy was forced to fight a war that it was unprepared for. It had neither enough ships, storage facilities...nor petroleum. But with a lot of hard work, hasty improvisation, sound leadership, and some honest good luck, it managed (with great difficulty at times) to supply its fighting forces with enough fuel for combat operations. Although the supply system was strained to the breaking point, it never collapsed.[140]

The fuel state in the first half of 1942 was straining the logistics support system to the breaking point. As previously mentioned, shortly after Pearl Harbor, the Pacific Fleet had, for all purposes, expended almost all the fuel stored aboard its oilers. With the Pacific Fleet's oilers supplying fuel to ships in the Hawaiian area, it meant new supplies were not being brought in from the mainland. Fuel and tankers became so scarce in the spring of 1942 that oil was scavenged from the unsalvageable battleships still resting on the bottom of Battleship Row.[141]

The fuel and tanker shortage became an operational factor almost immediately in the Pacific. The *Neches* was part of Task Force 14 sent to relieve Wake Island in December 1941. *Neches*' slow speed (task forces could proceed only as fast as the accompanying oiler), along with some bad weather, meant the Wake Island relief force was not in position to attack Japanese forces prior to the island's being overrun.[142] A later, planned airstrike by the *Lexington* task force against Wake in January 1942 had to be canceled when the Japanese submarine *I-72* sank that same oiler, *Neches*.[143] Pacific Fleet raids on Japanese-occupied islands in January and February 1942 would have been impossible without support from Navy oilers. In a precursor of events, one carrier raiding force that had *sortied* against Rabaul was forced to retire after the Japanese had discovered it, and much fuel was used up during high-speed maneuvering while fending off Japanese air attacks. The Doolittle raid on Tokyo, which was to have immense strategic implications for the Pacific war, also would not have been possible without tanker support.[144]

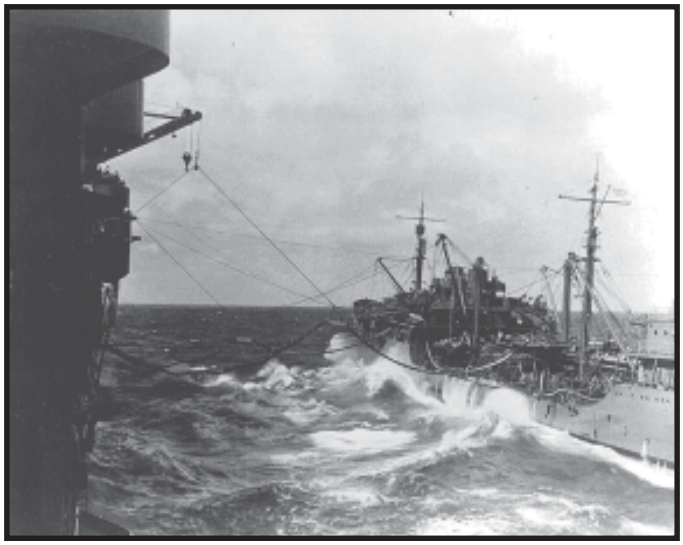

Figure 3. *Neosho* Refueling the *Yorktown*, Probably on 1 May 1942. *Neosho* and its escort, the destroyer *Sims*, were sunk by Japanese aircraft on 7 May 1942 after being misidentified as an aircraft carrier and a cruiser. However, by then, the *Neosho* had dispensed enough fuel to Task Force 17 for it to complete its mission of stopping the Port Moresby invasion force. Note the use of the *Yorktown* aircraft crane to support the refueling hose.[148]

The absence of tankers also was becoming a real concern for operations in the South Pacific in early 1942. Although it was merely a question of time before larger IJN forces overwhelmed US and Allied naval vessels during this period of the Southern Operation, the situation was aggravated by the loss of all available ABCD oil sources in that region by mid-February 1942. The loss of the fleet oiler *USS Pecos* to Japanese action exacerbated the situation further.[145]

The lack of fleet oilers also was a secondary factor from the Pacific Fleet's turning from a battleship-centric navy to one formed around aircraft carrier task forces. Even after Pearl Harbor, the Navy still had a sizable battleship force. Seven battleships were available at west coast ports in late March 1942. However, since the Navy tanker shortage was so acute, there were none available for duty with this force.[146] This force *sortied* on 14 April 1942 to help stem the Japanese advance in the South Pacific. The battleships were loaded down with so much fuel, food, and ammunition that armored belts and decks were below the waterline. If these ships had sailed into harm's way, they would not have lasted long. Fortunately, the Coral Sea action was decided before they could participate, and the force was ordered back to the west coast.[147]

The oilers that could not be spared for the battleships were supporting carrier forces engaged in the Coral Sea. Again, fleet oilers were indispensable to operations. Coral Sea fueling operations were aided by the oilers *Tippecanoe* and *Neosho* (Figure 3).

The fleet oiler *Neosho* supported Task Force 17, led by Rear Admiral J. Jack Fletcher aboard the carrier *Yorktown*. This was the same *Neosho* that was so pointedly ignored by the Japanese during the Pearl Harbor raid. Although sunk by Japanese aircraft on 7 May 1942, the *Neosho* had already played its critical role in dispensing fuel oil to Task Force 14. Had Fletcher needed more fuel, the situation might have gotten a little sticky.[149] Ironically, the Japanese ran into their first fuel problem. A lack of tanker support for their task force, as well as a lack of fuel for its aircraft, caused the Japanese Navy to halt its task force short of its goal, Port Moresby.[150]

Following the miraculous success at Midway, the Pacific Fleet was finally able to go on the offensive in August 1942 with Operation Watchtower, the invasion of Guadalcanal in the Solomon Islands. Inadequate fuel logistics were still a major concern.[151] Fuel and support depots had been set up in Tonga and New Caledonia to support the operation, but they were 1,300 and 500 miles away, respectively, from the action on Guadalcanal.[152]

Preliminary plans to supply oil for this operation were made based on the past experience of normal operations. The officer in charge of the operation, Admiral Robert L. Ghormely, tried to factor in problems that might arise, such as unforeseen losses or changes in operations. However, his logistics staff was small and had no experience. So a supply of fuel thought to be a comfortable margin for the Guadalcanal operation turned out to be an inadequate amount.[153]

With such a tenuous logistics situation, Operation Watchtower became known derisively as Operation *Shoestring* by the Marines who were surviving on captured enemy rations. Inadequate fuel supplies meant the aircraft carriers covering the Marine landing forces could not stay in place and, after 2 days, withdrew 500 miles to the south to refuel. Operations were touch-and-go on Guadalcanal for the next month. The US position could have been

put in jeopardy by a concerted attack on fuel supplies, but this never occurred.[154] In September, Ghormely finally started to get a handle on his logistics requirements, with detailed fuel requests being forwarded up the chain. His actions alleviated much of the fuel problem for the rest of the South Pacific Operation.[155]

With the increase of fuel supplies and the inability of the Japanese to dislodge the Marine defenders on Guadalcanal, the tide had truly begun to turn in the Pacific. From this point on, the Pacific Fleet's fuel situation grew stronger, while the Japanese position grew weaker. The Japanese had lost their opportunity to strike at the key vulnerability of the United States in the Pacific—fuel logistics.

Conclusions

God was on the side of the nation that had the oil.

—Professor Wakimura
Tokyo Imperial University in Postwar Interrogation[156]

The IJN's devotion to an outdated operational strategy, rather than focusing on what effects were needed to ensure their national strategy was met, proved to be their downfall. The Japanese knew that if they did not find a secure and stable source of oil they eventually would have had to comply with US prewar demands. Once it was realized that diplomatic measures would be ineffective, the Japanese plan was to seize and secure as much oil and other resources as possible. The raid at Pearl Harbor was but a branch to achieve that overall goal.

As effective as Japanese intelligence and initial military actions were, they never were focused on the destruction of the key target that might have let them achieve their goal of keeping the Navy out of the Pacific. The Japanese strategic disregard of the fragile US oil infrastructure in the Pacific was an incredible oversight on their part. The Japanese should have attacked the US oil supply at Pearl Harbor and followed up that raid with attacks on US oilers and tankers in the Pacific. Japanese attacks, in conjunction with German strikes, on the oil supply and infrastructure would have bought the Japanese much valuable time—time that could have been used consolidating gains in its newly won territories, time that might have allowed Japan to build up such a defensive perimeter that the cost of an Allied victory might have been too high.

The Japanese were not the first to ignore the importance and vulnerability of logistics. As long ago as 1187, history shows that logistics played a key part in the Muslim's victory over the Crusaders at the Battle of Hittin. The Muslim commander Saladin captured the only water source on the battlefield and denied its use to the Crusaders. The loss of water severely demoralized and debilitated the Crusaders, contributing to their defeat and eventual expulsion from the Holy Land.[157]

The vulnerability and importance of logistics remains evident today. The terrorist bombing of the destroyer *USS Cole* occurred while it was in port, fueling, at Aden, Yemen, on 12 October 2000. Had it not required fueling, the *USS Cole* would not have put in at Aden, 17 sailors would not have been killed, and the Navy would not temporarily have lost a valuable maritime asset.[158] There is an old saying, "Amateurs talk strategy, and professionals talk logistics." Commanders and their staffs must remember the importance of logistics to achieving the overall goal, for friendly forces as well as the enemy.

Notes

1. Kent Roberts Greenfield, ed, *Command Decisions*, Washington DC: Office of the Chief of Military History, Department of the Army, 1960, 100-101.
2. Military History Section, Headquarters, Army Forces Far East, Japanese Monograph No 147, *Political Strategy Prior to Outbreak of War, Part III*, Washington: Office of the Chief of Military History, Department of the Army, 1947, 12-13. For a chronological record of these and other events leading up to World War II, see Congress of the United States, *Events Leading Up to World War II*, Washington: US Government Printing Office, 1944.
3. Herbert Feis, *The Road to Pearl Harbor*, Princeton, New Jersey: Princeton University Press, 1950, 207.
4. Feis, 206.
5. *Japanese Monograph No 147*, 25.
6. Akira Iriye, *Pearl Harbor and the Coming of the Pacific War,* Boston: Bedford/St Martin's, 1999, 134. The ABCD powers were defined as the American, British, Chinese, and Dutch governments.
7. *Japanese Monograph No 147*, 28-33.
8. Iriye, 134.
9. *Japanese Monograph No 147*, 42-43.
10. Iriye, 136.
11. Eric Larrabee, *Commander in Chief*, New York: Harper & Row, 1987, 46.
12. *Papers Relating to the Foreign Relations of the United States, Japan: 1931-1941*, Vol II, Washington: US Government Printing Office, 1943, 266.
13. Iriye, 145.
14. Robert Goralski and Russell W. Freeburg, *Oil and War*, New York: William Morrow and Co, 1987, 101.
15. *Foreign Relations of the United States. Diplomatic Papers, 1941, Vol IV, The Far East,* Washington: US Government Printing Office, 1956, 840.
16. Goralski, 101.
17. Feis, 268.
18. Nobutaka Ike, *The International Political Roots of Pearl Harbor: The United States-Japanese Dyad, Translations of the Records of the Liaison Conferences 19 through 75;* and *Four Imperial Conferences*, report to Dr Thomas W. Milburn, Behavioral Sciences Group, China Lake, California: United States Naval Ordnance Test Station, 30 Mar 64-15 Jun 65, 16-17.
19. *Japanese Monograph N, 147*, 46-48.
20. Iriye, 128.
21. *Papers Relating to the Foreign Relations of the United States*, *Japan: 1931-1941,* Vol II, 137-143. In this correspondence, the Counselor of the US Embassy in Tokyo related to the Japanese Vice Minister for Foreign Affairs that any nation that was to prejudice British lines of communication could expect to come into conflict with the United States. When asked by the Japanese minister that if the Japanese attacked Singapore there would be war with the United States, the counselor replied that the situation would "inevitably raise that question." The US Ambassador, Joseph Grew, later confirmed this position to the Japanese Prime Minister.
22. Congress of the United States, Hearings before the Joint Committee on the Investigation of the Pearl Harbor Attack, Part 6, Washington: US Government Printing Office, 1946, 2866.
23. *Papers Relating to the Foreign Relations of the United States, Japan: 1931-1941,* Vol II, 556-557. It is interesting to note that, although these were rather explicit warnings sent by Roosevelt to the Japanese, Roosevelt himself questioned whether the United States had the political will to back them up. When asked by the Chief of Naval Operations, Adm H. R. Stark, what the US response would be in the event of an attack on British possessions in the Far East, Roosevelt responded, "Don't ask me these questions." See *Investigation of the Pearl Harbor Attack, Part 5,* 2231-2232.
24. Feis, 190.
25. Kent Roberts Greenfield, ed, *Command Decisions*, 106; also see Larrabee, 91.
26. Military History Section, Headquarters, Army Forces Far East, Japanese Monograph No 150, *Political Strategy Prior to Outbreak of War Part IV*, Washington: Office of the Chief of Military History, Department of the Army, 1947, 1.
27. Nobutaka Ike, *The International Political Roots of Pearl Harbor,* Imperial Conference, 6 Sep 41, 33-34.
28. John Buckley, *Air Power in the Age of Total War*, Bloomington, Indiana: Indiana University Press, 1999, 95.

29. Dr David C. Evans, *The Japanese Navy in World War II*, 2d ed, Annapolis Maryland: Naval Institute Press, 1986, 8-9.
30. Hiroyuki Agawa, *The Reluctant Admiral*, New York: Kodansha International, 1979, 197-198. The author relates two stories: one that shows how independent operational thought that ran counter to naval general staff policy was frowned upon. He also relates an incident during fleet map maneuvers that showed minor trivialities, such as logistics, could be discounted if overall results were negative to the desired outcome.
31. Gordon W. Prange, *At Dawn We Slept: The Untold Story of Pearl Harbor*, New York: McGraw-Hill, 1986, 10.
32. Prange, *At Dawn We Slept,* 12-14.
33. Prange, *At Dawn We Slept,* 20-28.
34. Shigeru Fukudome, "Hawaii Operation," *US Naval Institute Proceedings*, Dec 55, 1318. It is interesting to note that the two men who were to carry out the tactical part of the plan at Pearl Harbor—Nagumo and his chief of staff, Rear Adm Ryunosuke Kusaka—felt that the Hawaii Operation was too risky, and this apprehension stayed with them throughout the planning and execution of the attack. See also Agawa, 263-264.
35. *Command Decisions*, 109.
36. Fukudome, 1320.
37. Agawa, 235. This letter was written after the Naval General Staff approved the Pearl Harbor attack plan.
38. *Ibid*.
39. Military History Section, Headquarters, Army Forces Far East, Japanese Monograph No 152, *Political Strategy Prior to Outbreak of War, Part V,* Washington: Office of the Chief of Military History, Department of the Army, 1947, 50-51.
40. *Events Leading up to World War II*, 54.
41. Senator David I. Walsh, *The Decline and Renaissance of the Navy 1922-1944*, Washington: US Government Printing Office, 1944, 4-7.
42. Arthur Zich, *The Rising Sun*, Alexandria, Virginia: Time-Life Books, 1977, 87 and 89-97. When the Japanese attacked Guam on 10 Dec 41, the garrison of a little more than 425 men surrendered in less than 1 day. When attempts were made to increase the defenses of Wake and the Philippines in the second half of 1941, it was too little, too late. Wake fell on 23 Dec 41. Although the Philippines took longer to conquer (the Americans didn't formally surrender until 6 May 42), their demise was a forgone conclusion. The United States could not relieve the Philippines because there were no reinforcements available and no way to protect them even if they were.
43. The International Political Roots of Pearl Harbor, Imperial Conference, 5 Nov 41, 22-23.
44. *Japanese Monograph No 150*, 87-88.
45. *Japanese Monograph No 147*, 15.
46. Ronald Spector, *Eagle Against the Sun,* New York: The Free Press, 1985, 83.
47. Fukudome, 1319.
48. *The International Political Roots of Pearl Harbor*, Imperial Conference, 6 Sep 41, 37.
49. *Japanese Monograph No 150*, 20.
50. Goralski, 102.
51. Gordon W. Prange with Donald M. Goldstein, and Katherine V. Dillon, *Pearl Harbor: The Verdict of History,* New York: McGraw-Hill, 1986, 490.
52. *Investigation of the Pearl Harbor Attack*, *Part 6,* 2569.
53. Prange, *Pearl Harbor: The Verdict of History*, 482.
54. Homer N. Wallin, *Pearl Harbor: Why, How, Fleet Salvage and Final Appraisal,* Washington: Naval History Division, 1968, 60.
55. Takeo Yoshikawa and Norman Stanford, "Top Secret Assignment," *US Naval Institute Proceedings,* Dec 60, 27-29 and 33.
56. Goralski, 85.
57. John Costello, *The Pacific War,* New York: Quill, 1982, 84.
58. Homer N. Wallin, "Rejuvenation at Pearl Harbor," *US Naval Institute Proceedings*, Dec 46, 1521-1523. This total includes the floating drydock, YFD-2. It is also important to note that there were many ships of the Pacific Fleet that were not in Pearl Harbor that Sunday. For example, the carriers *Enterprise* and *Lexingto*n were ferrying USMC aircraft to Wake and Midway Islands in anticipation of war starting in the Pacific. Numerous other ships were patrolling in the Pacific or were in ports on the west coast.
59. Prange, *At Dawn We Slept*, 25 and 374. An interesting note of controversy exists over the primacy of battleships versus aircraft carriers as the primary targets of the Pearl Harbor raid. Genda had been pushing for carriers as the primary targets since Feb 41. Testimony made by Capt Mitsuo Fuchida during his interview with the US Strategic Bombing Survey team backs up Genda's statement (see *United States Strategic Bombing Survey* [Pacific], Interrogations of Japanese Officials, No 72, Vol I, 122. However, those statements do not jibe with "Carrier Striking Task Force Operations Order No 3" sent to the Pearl Harbor attack force on 23 Nov 41 (see Japanese Monograph No 97, *Pearl Harbor Operations: General Outline and Orders and Plans,* 14). In this order, Yamamoto specifies that both battleships and carriers will be attacked but battleships will be the priority targets for the first wave of attacking aircraft. Carriers were the priority of the second wave. Although the Japanese knew there were not any carriers in Pearl Harbor as of 6 Dec, there was a chance that one or more might return that night. "If that happens," said Genda, "I don't care if all eight of the battleships are away." "As an airman," remarked Oishi (Nagumo's senior staff officer), "you naturally place much importance on carriers. Of course, it would be good if we could get three of them, but I think it would be better if we get all eight of the battleships." (See Mitsuo Fuchida, "I Led the Air Attack on Pearl Harbor," *US Naval Institute Proceedings*, Sep 52, 944). Since no carriers did come into Pearl Harbor during the night of 6-7 Dec, the point is moot. However, it does give insight to the prioritization of potential targets in the eyes of the IJN leadership. It also gives pause to wonder what those Japanese airmen would have targeted first if the carriers had been in Pearl Harbor.
60. Fuchida, 945 and 951.
61. Prange, *At Dawn We Slept*, 506 and 538.
62. Prange, *At Dawn We Slept*, 539-540.
63. Prange, *At Dawn We Slept*, 25 and 503-504.
64. Prange, *Pearl Harbor: The Verdict of History*, 537.
65. Spector, 147.
66. Prange, *At Dawn We Slept*, 401.
67. Wallin, "Rejuvenation at Pearl Harbor," 1521. In addition, the target battleship *Utah* was not raised because of her age and the time and effort salvage would entail. Although she tends to be overshadowed by the memorial of her sister ship *Arizona* and the *USS Missouri* floating museum, a small monument to the *Utah* and the 58 men still entombed can be found on the west-northwest shore of Ford Island behind a family housing area. See also E. B. Potter, ed, *Sea Power—A Naval History*, Englewood Cliffs, New Jersey: Prentice-Hall, 1960, 651, for information on the *Arizona* and *Oklahoma*. Also, because of the shallow depth of the harbor, the Japanese had worked feverishly to develop a torpedo that would not dive to 60 feet before leveling out. By the addition of wooden stabilizers, they only were able to solve this problem in Oct 41 (see Prange, *At Dawn We Slept*, 160 and 321).
68. Prange, *At Dawn We Slept*, 374. The Japanese Ambassador to the United States, Nomura, who had no fore knowledge of the Pearl Harbor attack, saw this as a key tactical flaw in the Hawaii Operation (see Prange, *Pearl Harbor: The Verdict of History*, 538).
69. Fuchida, 952.
70. Prange, *At Dawn We Slept*, 542-545.
71. Prange, *At Dawn We Slept*, 545.
72. Evans, 40.
73. Fuchida, 950. See also Wallin, *Pearl Harbor: Why, How, Fleet Salvage and Final Appraisal*, 141.
74. Wallin, "Rejuvenation at Pearl Harbor," 1524.
75. In defense of Nagumo, machine and repair tools were notoriously hard to destroy. Industrial plants targeted by the US Army Air Forces in Europe would be destroyed, but the machine tools inside the buildings showed more durability. See the *United States Strategic Bombing Survey*, Maxwell AFB, Alabama: Air University Press, 1987, 15, 17-18.
76. Wallin, *Pearl Harbor: Why, How, Fleet Salvage and Final Appraisal,* 175. The salvage and repair operations at Pearl Harbor were nothing short of Herculean. A short summary will show the reader how quickly some temporary repairs were made. The *Pennsylvania* sailed to the west coast 2 weeks after the attack. The *Maryland* and *Tennessee* were ready for combat the same day. The destroyer *Shaw*, whose bow was blown off in a spectacular explosion, left for California under her own steam on 9 Feb 42. The *Nevada,* which Nimitz doubted would ever sail again, was in drydock by mid-February and en route to the west coast by mid-April (see Prange, *Pearl Harbor: The Verdict of History*, 538-539).
77. Naval Historical Center, Department of the Navy, Various photographs, 40-41 [Online] Available: http://www.history.navy.mil/photos/images, Feb 01. Drydock photos [Online] Available: http://www.history.navy.mil/photos/images/g380000/g387598c.htm.
78. Robert Cressman, *That Gallant Ship USS Yorktown* CV-5, Missoula, Montana: Pictorial Histories Publishing Co, 1985, 115, 117, and 118. To be filed under the heading of ironic justice, all four carriers had

participated in the Pearl Harbor attack; see Gordon W. Prange's *Miracle at Midway*, New York: McGraw-Hill, 1982, for an excellent review of that conflict.

79. *Investigation of the Pearl Harbor Attack, Part 6*, 2570. The upper tank farm was clearly visible next to the southeast loch of Pearl Harbor as Figure 2 shows. The lower tank farm was next to the Hickam Field water tower, an approximate 150-foot high obelisk, that was visible from up to 5 miles away (see *Investigation of the Pearl Harbor Attack, Part 38,* Item 117).
80. *Investigation of the Pearl Harbor Attack*, *Part 6,* 2812.
81. Wallin, "Rejuvenation at Pearl Harbor," 1524. The Navy realized the vulnerability of the oil supply and was in the process of building some underground storage tanks; however, these would not be completed until late 1942 (Gunter Bischof and Robert L. Dupont, ed, *The Pacific War Revisited*, Baton Rouge, Louisiana: Louisiana State University Press, 1997). There was to be a total of 15 underground tanks (100 feet wide by 285 feet high) with a storage capacity of approximately 4.5 million barrels, the same amount as the above-ground tanks. See *Investigation of the Pearl Harbor Attack, Part 23*, 966. Also see William M. Powers, "Pearl Harbor Today," *US Naval Institute Proceedings*, Dec 81, 52.
82. Prange, *Miracle at Midway*, 4.
83. Prange, *Pearl Harbor: The Verdict of History*, 485.
84. *Investigation of the Pearl Harbor Attack*, *Part 6,* 2506.
85. Goralski, 154. It should be noted that there are several discrepancies in the total amount of fuel in storage and total capacity available at Pearl Harbor on 7 Dec 41. Kimmel testified that there were 4 million gallons in storage (see *Investigation of the Pearl Harbor Attack, Part 6,* 2812). Adm Claude C. Bloch, commander of the 14th Naval District at the time of the attack, testified to the Hart Commission that there were approximately 4 million barrels in storage that morning (*Investigation of the Pearl Harbor Attack, Part 26*, 101). Goralski states that there were 4.5 million barrels stored. Since the purpose of the inquiries following the Pearl Harbor attack were to find out why the US Armed Forces on Hawaii were caught unawares and Goralski's work is more focused on the role of oil in war, his numbers will be used.
86. *Investigation of the Pearl Harbor Attack*, *Part 6,* 2570.
87. Photos [Online] Available: http://www.history.navy.mil/photos/images/g100000/g182880c.htm. The earthen berms located between the tanks were used to contain potential oil spills.
88. Prange, P*earl Harbor: The Verdict of History*, 509-510. The quote at the end is from Nimitz.
89. Duncan S. Ballantine, *US Naval Logistics in the Second World War*, Newport, Rhode Island, Naval War College Press, 1998, 39. Japanese aircraft destroyed the Cavite naval base on 10 Dec 41 (see *Dictionary of American Naval Fighting Ships,* Vol VII, Washington: Naval Historical Center, Department of the Navy, 1981, 282).
90. Bischof and Dupont, 61-62.
91. Bischof and Dupont, 43. By Mar 42, at least one navy tanker was sent to Abadan, Iran, to get oil to support operations in the South Pacific (see D*ictionary of American Naval Fighting Ships*, Vol VII, 282).
92. Prange, *Pearl Harbor: The Verdict of History*, 510.
93. Wallin, *Pearl Harbor: Why, How, Fleet Salvage and Final Appraisal,* 103-104. Also see Commanding Officer *USS Neosho*, "Report on Raid on Pearl Harbor, T. H., 7 Dec 41 [Online] Available: http://www.ibiblio.org/hyperwar/USN/ships/logs/AO/ao23-Pearl.html, 5 Mar 01.
94. Bischof and Dupont, 57. The Navy classified its oil tankers as fleet oilers. For the purposes of this article, Navy oilers is synonymous with tanker or oil tanker.
95. Ballantine, 4.
96. *Investigation of the Pearl Harbor Attack*, *Part 6*, 2504. Also see *Investigation of the Pearl Harbor Attack, Part 12*, 345-346. In addition, there were two other oilers in the Cavite Navy Yard the morning of the Pearl Harbor attack; they were attached to US Asiatic Fleet (see *Dictionary of American Naval Fighting Ships,* Vol VII, 282).
97. Prange, *Pearl Harbor: The Verdict of History*, 547.
98. *Investigation of the Pearl Harbor Attack*, *Part 6,* 2504, 2569, and 2732.
99. *Investigation of the Pearl Harbor Attack*, *Part 32,* 593.
100. *Investigation of the Pearl Harbor Attack*, *Part 6,* 2570. The Japanese knew the oilers were in Pearl Harbor; the Japanese consulate kept them informed on all ship arrivals and departures (see Fuchida, 943). The Japanese attack force made a conscious decision to not attack the *Neosho*. She was berthed at the F-4 fueling dock at Ford Island. In their planning, the Japanese had a torpedo bomber of the initial strike force tasked against the ship in this berth (torpedo track 3); the *Neosho* was not torpedoed. Later, when the *Neosho* was backing up the East Loch of the harbor, she was purposefully not attacked by a Japanese bomber who held its fire in order to strike the battleship *Nevada*. Strangely, the oiler at the F-4 berth was marked as sunk in Fuchida's post battle report (see Prange, *At Dawn We Slept*, 385, 512, 518, and 536). The Japanese were also aware that there were two oilers at Cavite; they even knew their names (see *Investigation of the Pearl Harbor Attack, Part 12,* 302-303). It is also a fair assumption that the Japanese knew the locations of the other oilers that were in port on the west coast on 7 Dec 41.
101. B. Orchard Lisle, "The Case for Aircraft-Carrying Oil Tankers," *US Naval Institute Proceedings*, Nov 42, 1555. There is debate on where *Lexington* departed from on the west coast, but there was a delay in her departure. Given the desire among naval officers to have as much fuel in their bunkers as possible, with time available to the *Lexington* prior to her departure from the west coast, it is assumed she topped off her fuel bunkers.
102. Susan Butler, *East to the Dawn*, Reading, Massachusetts: Addison-Wesley, 1997, 414. Also see Elgen M. Long and Marie K. Long, *Amelia Earhart,* New York: Simon & Schuster, 1999, 220. Ironically, the *USS Ramapo* was the other oiler at Pearl Harbor the morning of 7 Dec 41 (see *Investigation of the Pearl Harbor Attack*, *Part 12,* 348-349); also see *Commanding Officer USS Ramapo*. "Report on Raid on Pearl Harbor," 7 Dec 41 [Online] Available: http://www.ibiblio.org/hyperwar/USN/ships/logs/AO/ao12-Pearl.html, 5 Mar 01.
103. Ballantine, 40.
104. Roger Chesnau, *Aircraft Carriers of the World*, *1914 to the Present*, Annapolis, Maryland: Naval Institute Press, 1984, 201, 205, and 206.
105. Ian Sturton, ed, *Conway's All the World's Battleships 1906 to the Present,* Annapolis, Maryland: Naval Institute Press, 1987, 160, 164, 168, 172, and 176.
106. James C. Fahey, *The Ships and Aircraft of the US Fleet*, New York: Ships and Aircraft, 1945, 15, 18, 23-25.
107. "The Zig-Zag Course as a Defence Against Submarines," *US Naval Institute Proceedings*, Professional Notes, Aug 17, 1836. Although a dated article, this technique, which was a proven defense at the end of World War I, could be expected to be used at the start of World War II.
108. Bischof, 70.
109. *Investigation of the Pearl Harbor Attack*, *Part 6,* 2504.
110. *Strategic Bombing Survey*, 108.
111. Norman Polmar and Dorr Carpenter, *Submarines of the Imperial Japanese Navy,* Annapolis, Maryland: Naval Institute Press, 1986, 1.
112. Polmar and Carpenter, 12-13. Also see Potter, 796.
113. Polmar and Carpenter, 13-14. The midget submarines were to attack US warships in Pearl Harbor in conjunction with the air raid. Following the attack, none of the five midget submarines ever made it back to the mother ship.
114. Military History Section, Headquarters, Army Forces Far East, Japanese *Monograph No 108, Submarine Operations in the First Phase Operations, December 1941 to April 1942,* Washington: Office of the Chief of Military History, Department of the Army, 1947, 1.
115. Japanese Monograph N. 150, *Political Strategy Prior to Outbreak of War, Part IV*, 47.
116. Polmar, 11. The prewar strategy of the primary role of fleet attack remained unchanged until Apr 42. After this point, submarines switched to commercial shipping; however, most of these attacks seemed to concentrate in the Indian Ocean area, which had minimal effect on Pacific Fleet operations.
117. Donald J. Young, "For a week in December 1941, Japanese submarines prowled the Pacific coastline, searching for merchant ships to sink," *World War II*, Jul 98.
118. William Scheck, "Japanese submarine commander Kozo Nishino gained personal satisfaction from shelling the California coast." *World War II*, Jul 98, 18. Among other items, the article mentions the difficulty of keeping the submarine deck gun trained on targets while the submarine was constantly moving. Also the Japanese torpedo, a 24-inch, oxygen-driven weapon, had characteristics that more than doubled the nearest US model (see Prange, *At Dawn We Slept*, 394).
119. Young, "For a week in December 1941, Japanese submarines prowled the Pacific coastline, searching for merchant ships to sink," 27-29. It should be noted that the *I-17* attempted to shell the *Emidio* first, and the tanker was able to send out a distress call. Responding aircraft were able to drop depth charges on the sub—twice. Although the sub suffered no damage, the surface attack shows the increased risk the Japanese took.

120. Young, 29-32.
121. Carl Boyd and Akihiko Yoshida, *The Japanese Submarine Force and World War II,* Annapolis, Maryland: Naval Institute Press, 1995, 68-69.
122. William H. Langenberg, "A floatplane launched from an Imperial Japanese Navy submarine dropped its bombs in September 1942—the first time the continental United States was bombed from the air." [Online] Available: http://www.theistorynetcom/AviationHistory/articles/1998/11982_text.htm, 7 Mar 01.
123. Scheck, "Japanese submarine commander Kozo Nishino gained personal satisfaction from shelling California coast," 16-18. The sub commander Kozo Nishino had visited the refinery during the prewar period as the commander of a Japanese tanker. In a welcoming ceremony, he slipped on some oil and ended up in a cactus patch, much to the amusement of local refinery workers. Nishino, insulted by the laughter, saw his chance to get revenge in Feb 42. He peppered away at the refinery for 45 minutes with his 5.5-inch gun. He did not cause any significant damage, but apparently, it was enough to settle a personal score.
124. Juergen Rohwer, *Axis Submarine Successes 1939-1945,* Annapolis, Maryland: Naval Institute Press, 1983, 278-281.
125. Potter, 799.
126. *Events Leading up to World War II*, 310.
127. Ladilas Farago, *The Tenth Fleet,* New York: Ivan Oblensky Inc, 1962, 46-47, 55.
128. Goralski, 103-104.
129. Farago, 58. Estimates range from 25 to 44 ships sunk, depending on the source. It should also be noted that the Germans sank 74 ships within 300 miles of the American coast in Mar 42 alone; again, a high proportion of these were tankers. Losses were so bad that if the rate continued there would not be enough fuel to carry on the war (see also Goralski, 106-112).
130. Goralski, 106.
131. Farago, 58
132. *Investigation of the Pearl Harbor Attack*, *Part 6,* 2505. The destroyers (along with other ships transferred) were to be used in neutrality patrols to keep German naval forces out of the western Atlantic.
133. Goralski, 116.
134. Goralski, 109-111. The tanker shortage became so acute that some Liberty-type dry cargo ships were converted into tankers with most being delivered in 1943 (see L. A. Sawyer and W. H. Mitchell, *The Liberty Ships,* Cambridge, Maryland: Cornell Maritime Press, 1970, 161.
135. *International Military Tribunal for the Far East,* Vol 256, Tokyo, Japan, 1 Dec 47, 34257.
136. Goralski, 186-188.
137. Potter, 796.
138. John W. Masland, "Japanese-German Naval Collaboration in World War II," *US Naval Institute Proceedings*, Feb 49, 179 and 182.
139. Boyd and Yoshida, 189-190.
140. Bischof and Dupont, 78.
141. Wallin, "Rejuvenation at Pearl Harbor," 1545. About 1 million gallons of oil were recovered from the *Oklahoma* alone.
142. Bischof and Dupont, 66.
143. Bischof and Dupont, 77.
144. Worrall R Carter, *Beans, Bullets, and Black Oil,* Newport, Rhode Island: Naval War College Press, 1998, 17-20. The raid was a boost for American morale after a steady diet of defeat. It also confirmed to Yamamoto the need for the upcoming Midway operation, where the defeat of the Japanese Navy later proved to be the turning point in the Pacific war (see Prange, *Miracle at Midway*, 24-27).
145. Carter, 15-16. The *Pecos* was attempting to join her sister ship *Trinity* in the Persian Gulf when she was sunk. The oil situation became so critical that the Australian cruiser *Hobart* could not participate in the Java Sea battle on 27 Feb 42 because of a lack of fuel. Another factor in fueling operations was the excruciating pace of refueling operations. The 1938 standard tanker could pump only 200 tons of fuel per hour. The newer T-2 tankers could pump approximately 700 tons an hour. At the end of 1941, the Navy only possessed six of these T-2 types (Cimarron class) with four in the Pacific Fleet (see Lane C. Kendall, "Tanker Operation and Management," *US Naval Institute Proceedings*, Apr 57, 425. Also see Fahey, 48.
146. Spector, 158 and 168.
147. Carter, 11.
148. Photos [Online] Available: http://www.history.navy.mil/photos/images/g460000/g464653c.htm. Also see Carter, 20-21, and see Zich, 69.
149. Carter, 21.
150. Goralski, 156. This was the first time the Japanese were to run into a fuel supply problem. It was an awful portent of the IJN's future operations.
151. George C. Dyer, The Amphibians Came to Conquer: The Story of Admiral Richmond Kelly Turner, Washington: US Government Printing Office, 1972, 311-312.
152. Carter, 21, 23-24.
153. Carter, 24-25.
154. Goralski, 157. Japanese bombing and naval gunfire came close to putting the US airstrip Henderson Field out of action when critical fuel supplies were destroyed. Another time, the arrival of four tankers was said to have turned the battle, "If they hadn't arrived when they did, we wouldn't have Guadalcanal" said Ghormely.
155. Carter, 28, 30, and 32.
156. Goralski, 304.
157. Gerard Chaliand, ed, *The Art of War in World History,* Los Angeles, California: University of California Press, 1994, 400-404.
158. Speaker remarks and press coverage. Lecture to AY01 students and faculty, Air Command and Staff College, Maxwell AFB, Alabama, 15 Mar 01.

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(*Contractors on the Battlefield* continued from page 15)

25. *Ibid.*
26. Defense Systems Management College, *Acquisition Logistics Guide,* Fort Belvoir, Virginia: Third Edition, 1997, 1-5.
27. *Ibid.*
28. Gen John J. Jumper, "The Future Air Force," address, Air Force Association Air Warfare Symposium, Orlando, Florida, 31 Jan 03.
29. Peters, 24.
30. Maj Gen Norman E. Williams and Jon M. Schandelmeir, "Contractors on the Battlefield," *Army Magazine*, Jan 99, 32-35.
31. Senator Carl Levin, "US Military Commitments and Ongoing Military Operations," statement, Senate Armed Services Committee, Washington DC, 9 Sep 03.
32. Maj Christopher D. Croft, "Contractors on the Battlefield: Has the Military Accepted Too Much Risk?" Fort Leavenworth Kansas: School of Advanced Military Studies, Army Command and General Staff College, 2001, 8.
33. Zamparelli, 11.
34. Cahink, 69.
35. Croft, 9.
36. Lt Col Steven E. Newbold, "Contractors on the Battlefield, Competitive Sourcing and Privatization: An Essential Strategy," *Air Force Journal of Logistics*, Dec 99, 46.
37. *Ibid.*
38. *Ibid*.
39. Zamparelli, 11.
40. *Ibid.*
41. *Ibid.*

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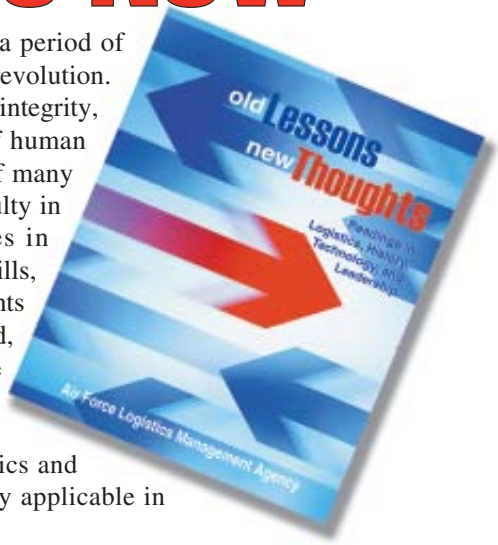

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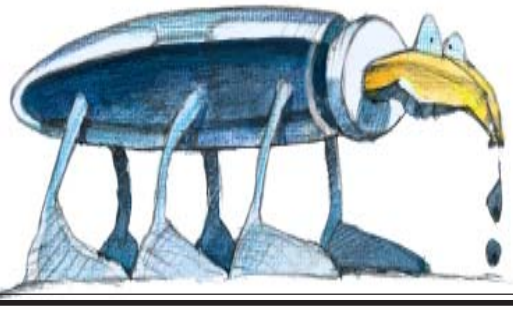

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